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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,781	02/13/2002	Jianying Li	GEMS8081.117	9495

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EXAMINER	
SONG, HOON K	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/683,781	LI ET AL.	
	Examiner	Art Unit	
	Hoon Song	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *20 May 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-9,11-17 and 19-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-9,11-17 and 19-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 February 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the non-zero voltage must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Non-zero voltage is not described in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4-9, 11-17 and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Blake et al. (US 6275560B1).

Regarding claims 1, 15, Blake teaches a method of voltage modulation for computed tomography (CT) imaging comprising the steps of (figure 3):

acquiring a set of cardiac signals (EKG) having a plurality triggering pulses (figure 3);

determining a period of delay (SYSTOLE) after each triggering pulse (R);

after each period of delay, energizing a high frequency electromagnetic energy source to a first voltage (X-ray on);

acquiring a set of imaging data of a scan subject (abstract); and

after acquiring the set of imaging data, energizing the high frequency electromagnetic energy source to a second voltage (x-ray off) until the period of delay after a next triggering pulse (figure 3).

Regarding claims 2 and 17, Blake teaches that the second voltage is less than the first voltage (figure 3).

Regarding claim 4, Blake teaches that the step of (figure 3):

determining a primary (DIASTOLE) and a secondary imaging stage (SYSTOLE) from the set of cardiac signals;

energizing the high frequency electromagnetic energy projection source to the first voltage during the primary imaging stage (X-ray on); and

energizing the high frequency electromagnetic energy projection source to the second voltage during the secondary imaging stage (x-ray off).

Regarding claim 5, Blake teaches that the step of filtering low energy high frequency electromagnetic energy projected to the scan subject to reduce high frequency electromagnetic energy exposure to the scan subject (column 4 line 45+).

Regarding claims 6, 16 and 19-21, Blake teaches that the step of determining a radiation dosage profile (on and off) from the set of cardiac signals (column 4 line 63+).

Regarding claim 7, Blake teaches a radiation emitting imaging system comprising:

a high frequency electromagnetic energy projection source configured to project high frequency energy toward a scan subject;

a detector assembly to receive high frequency electromagnetic energy attenuated by the scan subject and output a plurality of electrical signals indicative of the attenuation to a data acquisition system (32);

a control configured to:

determine a plurality of primary data acquisition stages and a plurality of secondary data acquisition stages (EKG);

energize the high frequency electromagnetic energy projection source to a first voltage during each data acquisition stage to acquire primary imaging data (DIASTOLE);

energize the high frequency electromagnetic energy projection source to a second voltage during each secondary data acquisition stage (SYSTOLE); and

reconstruct an image of the scan subject from the imaging data acquired during each data acquisition stage (abstract).

Regarding claim 8, Blake teaches a bowtie filter configured to filter a portion of the high frequency electromagnetic energy projected by the high frequency electromagnetic energy projection source to the scan subject (well known).

Regarding claim 9, Blake teaches that each data acquisition stage is followed by a secondary data acquisition stage (figure 3).

Regarding claim 11, Blake teaches that the plurality of secondary data acquisition stages includes a plurality of non-data acquisition stages (x-ray off).

Regarding claim 12, Blake teaches a plurality of EKG sensors configured to acquire a set of EKG signals of a cardiac region of the scan subject (figure 3).

Regarding claim 13, Blake teaches that the control is further configured to determine a data acquisition stage and a secondary acquisition system from the set of EKG signals.

Regarding claim 14, Blake teaches that the control is further comprised to determine a number of subsets from the set of EKG signals and determine a triggering pulse within each subset and energize the high frequency electromagnetic energy projection source to the first voltage after a delay of the triggering pulse (figure 3).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 22-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Ozaki (US 6298111B1).

Regarding claim 22, Ozaki teaches a method of cardiac CT imaging comprising the steps of:

Acquiring a series of cardiac signals defining a number of cardiac cycles (electro-cardiogram, figure 11);

Determining a primary acquisition period and a second acquisition period for each cardiac cycle (cardiac motion, figure 11);

Energizing an x-ray source to a default, non-zero voltage (tube current, figure 11);

Initiating CT data acquisition for the number of cardiac cycles (figure 11);

Energizing the x-ray source to a primary voltage during CT data acquisition for the primary acquisition period (high x-ray control signal, figure 11); and

Returning the x-ray source to the default, non-zero voltage during CT data acquisition for the secondary acquisition periods (figure 11, column 8 line 47+).

Regarding claim 23, Ozaki teaches the primary voltage includes a maximum voltage (figure 11).

Regarding claim 24, Ozaki teaches a radiation emitting imaging system comprising:

A high frequency electromagnetic energy projection source (x-ray source) configured to project high frequency energy toward a scan subject;

A detector assembly (23) to receive high frequency electromagnetic energy attenuated by the scan subject and output a plurality of electrical signal indicative of the attenuation to a data acquisition system (27);

A control configured to:

Model data acquisition for a heart of the scan subject based on a series of cardiac signals defining a number of cardiac cycles of the heart (figure 11);

Modulate voltage of the high frequency electromagnetic energy projection source between a first voltage (current tube, figure 11) and a second voltage (current tube, figure 11) during each cardiac cycle; and

Reconstruct an image of the scan subject for multiple phases of each cardiac cycle.

Regarding claim 25, Black teaches that the first voltage includes a default voltage and the second voltage includes a maximum voltage (tube current, figure 11).

Regarding claim 26, Black teaches the default voltage includes a minimum voltage required to acquire data (column 8 line 47+).

Response to Amendment

The amendment filed on May 20, 2003 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: non-zero voltage.

Applicant is required to cancel the new matter in the reply to this Office Action.

Response to Arguments

Applicant's arguments filed May 20, 2003 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., non-zero second voltage) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to applicant's argument that Blake et al. fails to teach energizing the high frequency electromagnetic energy source to a second voltage. The applicant further argues that zero voltage is not energized thus second voltage cannot be zero.

The examiner respectfully disagrees with the interpretation. Because nowhere in the claim teaches that the second voltage is energized at current state nor the x-ray source is at least minimally powered, rather the claim only teaches that the second voltage is achieved by in process of energizing (de-energizing) the first voltage. Thus, Blake et al. clearly teaches that energizing (de-energizing) the high frequency electromagnetic energy source to a second voltage (zero).

In response to applicant's argument that Blake et al. fails to teach the reconstruction an image from data acquired during each data acquisition stage.

The examiner respectfully disagrees with the interpretation. Because nowhere in the claim teaches that an image is reconstructed using two separate data from high

powered source image data and low powered image data and nowhere in the claim teaches that the reconstructed image include data acquired from second stage, rather the claim only teaches that the image was reconstructed using data acquired during each data (powered and non-powered source) acquisition stage. Thus, Black et al. clearly teaches that the reconstructing an image from data (powered x-ray) acquired during each (during powered and non-powered) data acquisition stage.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is 703-308-2736. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on 703-308-4858. The fax phone numbers

for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Hoon Song
August 4, 2003

DAVID V. BRUCE
PRIMARY EXAMINER